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AUTHOR McCoy, Brenda S.
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ABSTRACT

This paper is an annotated bibliography of 16 publications from 1994 through 1997 investigating the influence of CD-ROM technolcgy in reading instruction and language development. Entries are listed alphabetically by author. In addition to full bibliographic information, each entry summarizes the publication in a few paragraphs. (EV)

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THE INFLUENCE OF CD-ROM TECHNOLOGY ON READING INSTRUCTION AND LANGUAGE DEVELOPMENT: AN ANNOTATED BIBLIOGRAPHY

Adam, N., & Wild, M. (1997, June). Applying CD-ROM interactive storybooks to learning to read. Journal of Computer Assisted Learning, 13(2), 119-132.

The authors report on a study that investigated the effect of multimedia CD-ROM storybooks on the reading attitudes of 45 third grade students over a period of four weeks. The research methodology, a pretest-posttest experimental design, included the use of questionnaires, interviews, and unstructured observations. The control and treatment groups were composed of randomly assigned reluctant and willing readers.

No significant difference in attitude toward reading was recorded between the treatment and control groups. When the focus shifted to the treatment group only, however, the reluctant readers demonstrated a significant and positive development in their attitudes toward reading while the willing readers' attitudes remained the same.

The reluctant readers also demonstrated an attitudinal preference for reading CD-ROM storybooks as opposed to traditional reading materials. These children cited the use of the programs' interactive multimedia components, the control of the reading process and environment, and changes in the perceptions of their reading competency as reasons for their preference.

The authors recommend additional research that would utilize a longer treatment period and/or a larger number of readers over a wider selection of schools.

Thirty-six sources are included in the bibliography.

Burton, A. M. (1996, April). Reading with a technology twist. Paper presented at the Annual Convention and Exposition of the National Catholic Educational Association. (ERIC Document Reproduction Service No. ED 396 267)

The author reviews several publications that focus on the effects of CD-ROM programs as they relate to reading instruction and language development. Included in the review are references to Reinking's monograph, Electronic Literacy (1994), a 1996 article by Klesius and Griffith entitled "Interactive

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Storybook Reading for At-Risk Learners," the research of Guthrie and Richardson (1995) that focuses on computer literacy in the primary grades, a three-year study of Head Start programs, and the work of Peterson and Eeds (1990) that addresses the benefits of collaboration in the construction of meaning.

Outcomes and recommendations of the reviewed sources are highlighted. The author also suggests programs on CD-ROM for incorporation into the reading and writing curriculum. The paper concludes with a brief discussion of multiple intelligence theory (Gardner, 1993) and describes the potential that the computer offers in this regard.

Eight sources are included in the bibliography.

Darby, R., Dawes, A. D., Gallagher, C., Loomes, W., Reid, H., and Stanton, J. (1997). Reading on screen: Exploring issues in reading for information with CD-ROM. English in Education, 31(2), 34-44.

The authors, a group of British primary teachers, describe the insights that they gained as a result of their participation in an Instructional Technology (IT) and English project that was designed to find and promote effective practice. Ruth Darby, Advisory Teacher of IT, provided inservice training to the group. Lorraine Dawes, Advisory Teacher for English, met with the group periodically to reflect on the children's reactions.

Helen Reid (Goodmayes Primary) noted an extra enthusiasm and concentration span and an increase in the less-able children's confidence to try the products. Reid also found that it was valuable for the children to purely explore with the CD-ROM on the first meeting. Organization techniques that were found to be helpful included the use of trained parent helpers and peer tutoring.

Andrea Dennison (Redbridge Junior School) offered insights that focused on collaboration: group structure, note-taking, speaking, and listening. She found that friendship groups at the computer worked best, collaboratively and supportively. She noted that the members of the friendship group were able to negotiate their ideas and speak more confidently.

Wendy Loomes (Gearies Junior School) discussed strategies for dealing with text from CD-ROMs. Her students, twenty-eight mixed-ability children, generally felt that they could find information more quickly when they used the CD-ROM format. They also spent more time dealing with text on CD-ROM than with text from a book. Loomes also noted the students' willingness to edit text on screen as she observed tne enjoyment that the students took in their ability to delete or edit in a few seconds whole chunks of writing.

Justine Stanton (Fairlop Primary) observed that when researching facts in books, her students were content to focus on the detail found on one page. With CD-ROM, however, they routinely checked more than one source for information. Stanton also found that her initial expectations of the medium were stretched by the children's ability to embrace new ideas. She observed that the technology did not remove or replace books, but rather encouraged the use of written material.

Chris Gallagher (Gilbert Colvin Primary School) believes that the use of CD-ROM fosters the use of books. He has found that children often consult reference books for fuller answers to the questions that the CD-ROM has raised. Gallagher also contends that children feel more familiar with the medium and, as a result, are confident to comment critically on its quality. He goes on to state that it is rare for a child to comment on or even notice the layout of a text book.

Ruth Darby (Advisory Teacher for IT) discusses the implications of this research for schools. She believes that the potential for enriching and enhancing the English curriculum with IT is considerable. She notes several issues that highlight aspects of the development of IT in schools, including: hardware and software, the teachers' IT skills, and long-term planning.

DeJean, J., Miller, L., & Olson, J. (1995, June). CD-ROM talking books: A case study of promise and practice. Paper presented at the Annual Conference of the Canadian Society for the Study of Education. (ERIC Document Reproduction Service No. ED 385217)

This study, the beginning of a three year longitudinal investigation, describes and analyzes the use of CD-ROM talking books in one third grade classroom over a period of four months. The teacher's intentions, how she planned to use the books, and her actual implementation techniques are described.

Data was gathered via interviews and observations. The data analysis disclosed four categories of information: (1) The suitability of the CD-ROM books in the language arts and thematic units based curriculum, (2) the teacher's best intentions, (3) CD-ROM books as personality, and (4) the children's use of the books in terms of cooperation versus competition.

Congruencies and incongruencies were revealed in terms of suitability and the teacher's intentions. In keeping with previous studies, it was noted that the computers took on a role that appeared to go beyond their utility. A finding that was surprising to the researchers centered on the children's use of the books in terms of cooperation versus competition. Observations revealed that classroom

pairings with the CD-ROM books often resulted in power struggles and selfish behavior. It was reasoned that since the CD-ROM books offered many possibilities, the students struggled with each other to have their individual needs met.

Forty sources are included in the bibliography.

Greenlee-Moore, M. E., & Smith, L. L. (1994, November). Interactive computer software: The effects on young children's reading achievement. Paper presented at the Annual Meeting of the College Reading Association. (ERIC Document Reproduction Service No. ED 384019)

This study investigated the effects on reading comprehension of 31 fourth-grade students when reading narratives from traditional print books were compared to reading the same narratives via the computer. Seven books were selected for the study, five that were categorized as shorter and easier narratives and two as longer and more difficult narratives.

The dependent variable for the study was student scores on paper-administered comprehension questions. Both the experimental (computer) and control (traditional book) groups participated in seven 60-minute sessions over an eight-week period. A repeated measure analysis of variance (ANOVA) was used to compute how the students' comprehension abilities varied between the two groups.

While the results indicated that no significant difference existed between the two groups when the subjects were reading the shorter and easier narratives, the analysis of variance showed significantly higher comprehension scores for the experimental group when students were reading the longer and more difficult narratives. These and other authors believe that the results support the argument that when reading more difficult and lengthy narratives, the textual manipulations of the interactive CD-ROM software produce higher scores on comprehension questions related to the text.

While affective changes were not documented in the study, informal observations revealed that the students who employed the CD-ROM software clearly enjoyed the use of background music, sound effects, and textual manipulations. Additional recommendations for continued research are outlined.

Eighteen sources are included in the bibliography.

Harrington-Lueker, D. (1996, November). Can technology help teach reading right? Electronic Learning, 16(3), pp. 32-39.

The author describes the ongoing debate between phonics and whole language advocates. Specific examples of how reading teachers are using technology to support both phonics and whole language instruction are then presented. Among them are those of Pam Williams, a first-grade teacher, who uses The Little Planet literacy series to help her students with sequencing, Tim Lauer who uses Holt Rinehart and Winston's Impressions series to integrate real literature with the phonics-intensive Story Box Books from Rigby, Lee Woldt, a language arts specialist, who uses IBM's Writing to Read to combine phonics with books on tape and story writing, and Lee Sattelmeyer, whose third-grade students use HyperStudio to create multimedia group projects that integrate Internet research. To give students practice with vowel sounds, Sattelmeyer also uses WordMunchers from MECC.

Differing perspectives of electronic books (e-books) are addressed. While some educators believe that the graphics and hyperlinks of e-books capture the students' interest and provide a richer context for comprehension, others argue that the hyperlinks can sometimes create distractions that may actually hinder learning.

The author concludes the article by calling for a consensus of "agreed-on knowledge" that will address the best practices in reading and technology integration. The need for increased pedagogical awareness and computer access is also noted.

Kahn, J. L. (1997, October). Scaffolding in the classroom: Using CD-ROM storybooks at a computer reading center. Learning and Leading with Technology, 25(2), 17-19.

Jerome Bruner (1978) uses the term scaffolding to describe what parents and teachers do when they read to children: Provide help and support, gradually withdrawing it as the child no longer needs it. The author believes that a single computer used as a classroom reading center with a selection of CD-ROM storybooks can also serve to scaffold students' developing literacy.

While CD-ROM storybooks combine many of the advantages of audio and print books with the additional benefits of animated illustrations, equivalents in other languages, and related games and activities, the author believes that the selection of individual titles should be done carefully. Criteria and strategies for the evaluation and selection of CD-ROM software are outlined. The author also describes several ideas for planning its use in the classroom. Specific examples

highlight the implementation of headphones, classroom strategies, and activities that extend the experience.

Large, A. J., Beheshti, J., Breuleux, A., & Renaud, A. (1995, Fall). Multimedia in primary education: How effective is it? School Library Media Quarterly, 24, 19-25.

The authors report on their investigation of the role of multimedia in student learning. The project was implemented in three phases to a group of randomly selected sixth-grade students from five Montreal public primary schools. The objective of the project was to establish whether animation added to a text enhanced learning, and if so, under what conditions the effect could be maximized. Several different evaluation measures were employed: written recall, multiple-choice questions, problem solving, and enactment of a procedure. Multivariate repeated measures of analysis of variance were applied to the collected data.

The authors found that while the addition of animation to text in a multimedia environment could enhance student learning, its effect was subtle and dependent upon a number of factors. At higher levels of cognitive processing, as measured by the enactment and problem-solving tests, the positive effect of animation was evident. Comprehension was also facilitated by the addition of animation to text. In all three phases, however, the groups with animation failed to outperform the other groups on the recall measure.

Overall, animation had the greatest effect with the simple procedural text. Important considerations that were addressed by the authors involved the clarity and duration of the animation, the semantic overlap between the animation and the text, and the linkages between the two media.

The authors argue that the addition of animation to a text will not of itself produce a positive learning effect. In conclusion, they call for additional research that will identify the factors that will make for an effective multimedia learning tool.

Twenty-six sources are included in the bibliography.

LoMonico, M. (1995, October). Using computers to teach Shakespeare. English Journal, 84(6), 58-61.

The author, a master teacher at Farmingdale High School in New York, discusses various aspects of Shakespeare-related software and describes several strategies for classroom integration. By using complete texts on disc, the author describes how teachers are afforded opportunities to select and print out scenes, enlarge font

sizes for whole class exercises, easily customize the text to meet the needs of particular classes, and create assessments that provide a more effective means for evaluating student comprehension.

LoMonico notes that the word search features of many programs assist students as they look for patterns, themes, and/or ideas. He found that when essays are generated in this way, students are given opportunities to do pure textual research, thereby eliminating the need for literary critics or study aids.

The article concludes with a description of several Shakespeare software titles and their distinctive features. Online resources, including the Teaching Shakespeare forum and the SHAKESPER electronic seminar are also highlighted.

While the author notes that some software is gimmicky and inappropriate for the classroom, he argues that many programs offer opportunities for exploration that are new, exciting, and stimulating.

Matthew, K. (1997). A comparison of the influence of interactive CD-ROM storybooks and traditional print storybooks on reading comprehension. Journal of Research on Computing in Education, 29(3), 263-275.

The author reports on two experiments that were designed to study the impact of electronic text on the reading comprehension of third-grade students. The sample, chosen from a school district located within the city limits of a large southwestern municipality, included 37 matched pairs for experiment one and 30 students from the traditional print storybook group for experiment two. The reading comprehension assessment was based on open-ended questions and story retelling.

For the first experiment, students worked with the researcher in groups of four for approximately one hour each week for four weeks. The control group read the print versions of the books while the experimental group read the CD-ROM versions. A t-test for paired samples was used to analyze the data. While no statistically significant difference in reading comprehension was found between the experimental and control groups as measured by open-ended questions, a statistically significant difference was found as measured by the story retellings for the group that read the CD-ROM versions of the stories.

In experiment two, the students worked with the researcher in groups of four for approximately one hour each week for two weeks. The students read the print versions of two books and the CD-ROM versions of two additional books. An analysis of variance was used to analyze the data on reading comprehension as

measured by story retelling. It was found that the reading comprehension of the students was significantly higher when reading the CD-ROM storybooks.

The author notes that the narration, online definitions, sound effects, and animations of the CD-ROM storybooks provided support that enabled the students to focus on meaning rather than decoding. The need for teacher support, monitoring, and intervention was also highlighted as a mandatory requirement for success.

While the electronic texts increased reading comprehension for most of the students, it was also found that 17% had higher mean comprehension scores when reading print texts. The author argues that the use of both electronic and print texts as complements to each other facilitates the different learning styles that exist in the classroom.

In closing, the author describes additional avenues for further research that focus on student motivation and the impact of CD-ROM books on second language students.

Fifty-nine sources are included in the bibliography.

Matthew, K. I. (1996). Using CD-ROMs in the language arts classroom. Computers in the Schools, 12(4), 73-81.

The author discusses the use of CD-ROM interactive books and reference materials in the elementary and secondary classroom. Curriculum changes and changes in the roles of the teachers and students are also highlighted.

The need for CD-ROM evaluation criteria is noted. The author discusses several criteria for the evaluation of CD-ROM software as she reviews specific CD-ROM titles. She also elaborates on several activities that demonstrate effective curriculum integration strategies. Specific examples of material selection, activity development, and classroom implementation are discussed with regard to the topics, Shakespeare and fables.

The author highlights several research studies that support the use of CD-ROMs in the classroom. It is argued that CD-ROMs offer unique features that demonstrate a positive influence on student attitudes, motivation, and reading achievement.

Forty-one sources are included in the bibliography.

Mike, D. G., & Stearns, P. H. (1994, May). Interactive literacy. Electronic Learning, 13(8), pp. 50-54.

Mike, Assistant Professor of Education at the State University of New York, discusses nine criteria for evaluating electronic reading packages for school use: interactivity, speed, clarity, speech/sound, graphics, second language support, integration of writing, teacher management and control, and auxiliary materials. He also analyzes four specific programs from EduQuest, Scholastic, Houghton Mifflin, and Computer Curriculum Corporation in conjunction with Silver Burdett Ginn.

Stearnes, Adjunct Instructor at the State University of New York, continues the article with a look at some of the quality electronic books that come from the home/consumer market. Trendsetters from Living Books and Discis Knowledge Research are highlighted along with three additional contenders from Sierra On-line, Sanctuary Woods, and Putnam New Media.

Miller, L., Blackstock, J., & Miller, R. (1994). An exploratory-study into the use of CD-ROM storybooks. Computers & Education, 22(1-2), 187-204.

The authors present an investigation that examined the reading behaviors or four eight-year-old children who engaged in repeated readings of selected CD-ROM storybooks and hard-covered books. Features of multimedia technology that have the potential to impact the teaching of reading are discussed. The study's research questions, methodology, data collection procedures, and data analyses are also outlined.

Case studies describe the salient behaviors of the participants in their use of the CD-ROM storybooks. Tables highlight information about the reading sessions that were undertaken by each child.

The researchers found that the on-demand mediation features of the CD-ROM books played an important role in promoting reading improvement. Evidence also suggested that the words learned via the use of the CD-ROM storybook features transferred and were recognized outside the context of the selected stories that were read as part of the study. While teacher intervention was not considered mandatory for reading improvement, it was found that teacher monitoring was needed for proper data interpretation.

Forty-nine sources are included in the bibliography.

Okolo, C., & Hayes, R. (1996, April). The impact of animation in CD-ROM books on students' reading behaviors and comprehension. Paper presented at the Annual International Convention of the Council for Exceptional Children. (ERIC Document Reproduction Service No. ED 395 434)

The authors report on the reading behaviors and comprehension scores of twenty primary students (with and without mild learning disabilities) who utilized three different reading conditions: (a) adult reading a book to child, (b) child reading a Discis Book (the low-animation condition), and (c) child reading a Living Book (the high-animation condition). Two reading assessment measures were used: (a) story retelling and (b) comprehension questions.

Sixteen students (80%) stated that they liked the story in the high-animation condition best. The children also spent more time and engagement in the high-animation condition. The highest scores on comprehension questions, however, were obtained in the adult-reader condition.

The authors found that the high-animation sequences often caused the children to draw conclusions that were inconsistent with the text. It was also found that the digitized speech features that could be used to improve word recognition and comprehension were not utilized by the students extensively.

Suggestions for instruction and guidance for CD-ROM book use are presented. Seventeen sources are included in the bibliography.

Sharp, D. (1996, January-February). Partnering with electronic books and literature. Media & Methods, 32(3), pp. 24-25.

The author, Senior Research Associate and Director of the Young Children's Literacy Project of the Learning Technology Center at Vanderbilt University, offers several suggestions that can be used to enhance the benefits that are derived from utilizing electronic books with traditional print books in the classroom setting. Ideas, methods, and strategies highlight features that electronic books offer, such as graphics, interactivity, and digitized speech.

A sidebar that lists the names and telephone numbers of fifteen electronic book publishers is also presented.

Talley, S., Lancy, D. F., & Lee, T. R. (1997). Children, storybooks, and computers. Reading Horizons, 38(2), 116-128.

The authors describe how CD-ROM storybooks were utilized in a study that involved 73 four-year-old Head Start children in Northern Utah. The purpose of the study was (a) to determine the feasibility of using CD-ROM storybooks in Head Start, and (b) to probe the usefulness of CD-ROM storybooks in closing the "readiness" gap between preschoolers with lots of prior exposure to storybooks and those with much less experience.

IBM's *Stories and More* were utilized throughout the study. Three measures, the (a) *Print Awareness Test* (Huba & Kontos, 1985), (b) *Concepts About Print* (Clay, 1979), and (c) *Picnic* (McCully, 1984) provided the means for the researchers to assess the children's level of print awareness, print conventions, and understanding of story structure and sequence, respectively. The data analyses included the use of a parent questionnaire, Analysis of Variance procedure, and paired t-test. Three tables display the results of the study for the experimental, control, and well-read-to groups.

While the results indicated that CD-ROM storybook programs had a positive effect on the emergent reading skills of those children who were not well-read-to prior to entering school, the authors recommend additional research. They also caution that while the use of CD-ROM storybooks in the preschool setting does seem to have promising results, it does not replace a literacy rich environment in the home.

Nineteen sources are included in the bibliography.

By Brenda S. McCoy, Assistant Professor, Instructional Technology, Georgia College & State University, Milledgeville, Georgia